R E P O R T R E S U M E S

ED 019 462 VT 002 854

EDUCATIONAL STABILITY IN AN UNSTABLE TECHNICAL SOCIETY.

BY- LESSINGER, LEON

PUB DATE 65

EDRS PRICE MF-$0.25 HC-$0.32 6P.

DESCRIPTORS- CURRICULUM PLANNING, *HIGH SCHOOL CURRICULUM, *CONCEPTUAL SCHEMES, TECHNOLOGICAL ADVANCEMENT, VOCATIONAL EDUCATION, OCCUPATIONAL CLUSTERS, *VOCATIONAL DEVELOPMENT,

CURRENT OPINION REGARDING THE ROLE OF THE HIGH SCHOOL IN PROFESSIONAL, TECHNICAL, AND VOCATIONAL EDUCATION IS THAT CHANGES IN TECHNOLOGY MAKE IT IMPOSSIBLE FOR SCHOOLS TO DO ANY TRAINING OTHER THAN GENERAL EDUCATION, OR THAT YOUTH SHOULD BE TRAINED WITH ONLY IMMEDIATE SALEABLE SKILLS BECAUSE THEY WILL HAVE SEVERAL CAREERS BEFORE RETIRING AND WILL NEED RETRAINING. NEITHER POSITION SEEMS ADEQUATE BUT BOTH MUST BE UTILIZED IN VARYING PROPORTIONS ACCORDING TO THE NATURE OF THE JOB FAMILY BEING PREPARED FOR. UNDERLYING ALL PROFESSIONAL, SKILLED, AND TECHNICAL OCCUPATIONS LIES A SUBSTANTIAL SET OF BEHAVIORS WHICH CAN BE TAUGHT AND DESCRIBED AND WHICH ARE REMARKABLY STABLE. A PROPOSED MODEL OF STABLE BEHAVIORS CONSISTS OF AT LEAST 12 OBSERVABLE, DEFINABLE, AND TEACHABLE STAGES--(1) THE SCIENTIFIC METHOD (DATA PROCUREMENT, OBSERVATION, RECORDING, ORGANIZATION, INTERPRETATION, AND EVALUATION), (2) SOCIAL SCIENCE AND ECONOMICS PHILOSOPHY, (3) FINANCE, (4) MANAGEMENT AND PRODUCTION, (5) SALES AND ADVERTISING, (6) TRANSPORTATION AND LOGISTICS, AND (7) ACCOUNTING AND ANALYSIS. A PROGRAM BASED ON THESE BEHAVIORS RESOLVES INTO AN APPLIED SCIENTIFIC METHOD AND COULD BEST BE CARRIED OUT AS A 2- OR 3-HOUR CORE PROGRAM UTILIZING TEAM TEACHING. PUPILS TAUGHT BY THIS METHOD WOULD GAIN COMPETENCE IN THE APPLIED SCIENTIFIC METHOD AND FAMILIARITY WITH WIDE VARIETY OF JOBS. PROFESSIONAL, TECHNICAL, AND VOCATIONAL EDUCATION MUST BE VIEWED AS A WHOLE. THIS DOCUMENT APPEARED IN THE "JOURNAL OF SECONDARY EDUCATION," VOLUME 40, NUMBER 5, MAY 1965. (MM)

DEC 27 1965

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

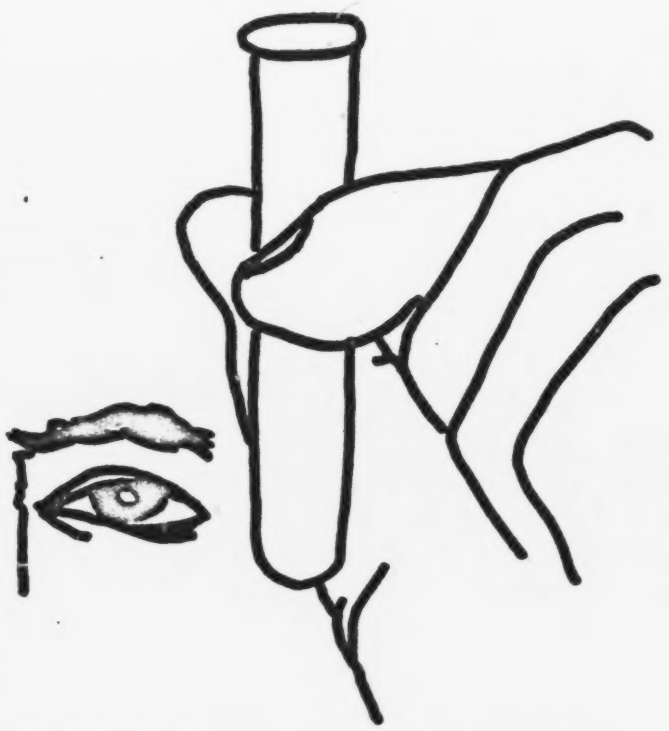
Educational Stability in an Unstable Technical Society

ED019462

V-T02854

LEON LESSINGER

An analysis of most so-called comprehensive high schools today would show that neither the present college preparatory program, the present vocational or industrial arts program, nor the present general or "cafeteria style" non-college preparatory program provides satisfactory preparation for the great range and rapidly diversifying set of post-secondary school opportunities.



INFORMED opinion regarding the role of the high school in professional, technical and vocational education seems to fall into two camps. One position might be described as the camp of the Greek, Heraclitus, and the other, the camp of the American behaviorist, Watson. The Heraclitians hold to the belief that there is nothing true but change—that the impact of automation and changes in technology are such as to make it impossible for schools to do any training save that of general education in English, the sciences, mathematics, and so forth. The Watsonians, on the other hand—in the great American tradition of optimism—are interested in simulating some of the more important present occupations at the high school level in the belief that youth with immediate saleable skills can be gainfully employed, and when necessary, retrained to meet changing conditions. They hold to the belief that youth soon to enter the labor market will hold two, three, and even more careers before they will retire from the labor market, hence they see little possibility for career training in the school.

It would appear that both the Heraclitian and Watsonian positions have merit, but that neither position is adequate. Analysis of the occupational world indicates that both positions must be utilized in varying proportions according to the nature of the job family for which the pupil is preparing. More importantly, underlying all the professional, skilled and technical occupations, lies a substantial set of behaviors which can be taught, described, and are remarkably stable. It is this stable structure which should be carefully considered by educators.

Figure One, "A Set of Stable Behaviors in an Unstable Technical Society," illustrates the relatively fixed nature of technical and professional work methodology. The model centers on the occupational

DR. LEON LESSINGER *is Superintendent, San Mateo Union High School District, San Mateo, California.*

team which society has already created to fulfill its professional, technical and vocational objectives. The four-level occupational team which has become increasingly typical of modern business, government, and industry, reflects the complexity of the current world of work. Today, education stands directly between man and his job. Formal educational training is required for entrance into appropriate job families. Thus, there are jobs requiring four or more years of a college education, jobs requiring some college education, and jobs requiring a high school education. While there still are jobs with fewer educational requirements, these are relatively few and swiftly declining in number. The comprehensive high school must recognize its responsibility in the post-high school preparation of all children. The figure highlights this concern by focusing on the multi-faceted nature of the high school in juxtaposition to the traditional college-prep/non-college-prep dichotomy.

FIGURE One shows that the stable behaviors consist of at least twelve observable, definable, and teachable stages. Even though the stages are listed in numerical order, it should not be assumed that they will necessarily be found or taught in this order. Indeed, experience has shown that any stage may be entered with subsequent work encompassing the other stages in any order which happens to be appropriate. For the purposes of description, the stages will be presented in numerical order.

Stage I is a data procurement stage. Here, data in the form of receipts, measures, physical samples and the like are secured for or by the pupils either from experiments which were conducted or which they conduct, or from natural situations such as receipts from an ongoing business, or soil samples from a civil engineer.

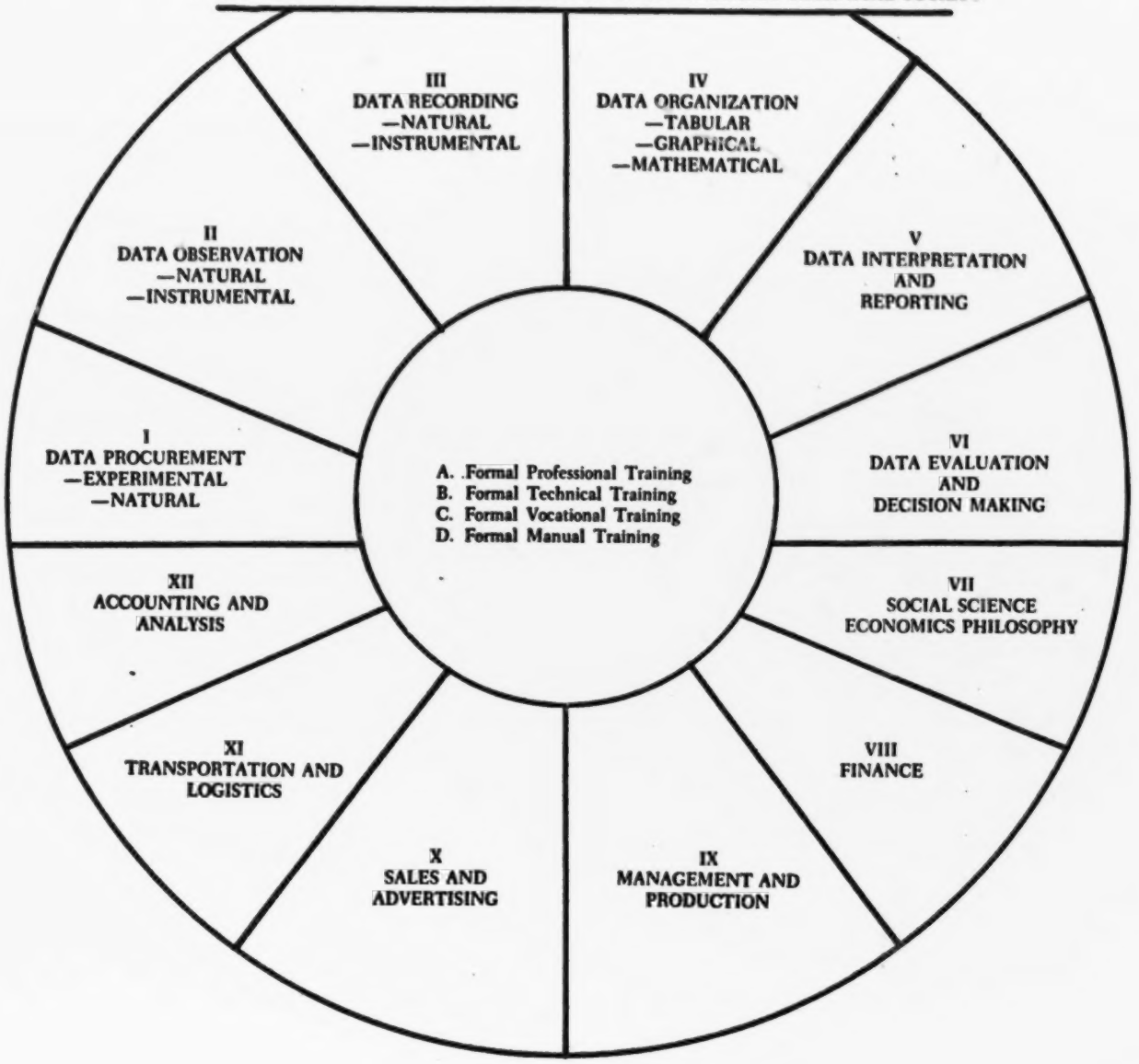
The next stage is data observation. Pupils take the data which was secured from experiments or from natural sources, and perform certain observations upon these data. Their observations may take a natural form—that is, they may use their physical senses, or the observation may be aided through the use of a variety of instruments. The instrumenting of observations can be simple or magnificently complex, and can form highly instructive and motivating instructional experience.

The third stage is data recording. Pupils observe the data and then record what they have observed. Here again, the data may be recorded in a "natural" way—that is, using a simple pencil and paper, or the process of recording can be highly instrumented, affording productive areas of instruction and motivation.

The fourth stage is concerned with data organization. Pupils learn to tabulate, graph, and use mathematical insights in the form of tables, simple statistics, and so forth. The object of this stage is to prepare the data which was recorded in a useable form for the subsequent stages. It is entirely possible that data may be recorded in a prearranged organizational pattern.

The fifth stage logically follows the fourth or organizational stage, and consists of data interpretation with the reporting of the interpretation. In this

FIGURE ONE: A SET OF STABLE BEHAVIORS IN AN UNSTABLE TECHNICAL SOCIETY



stage, the pupil needs skill in technical writing.

In the sixth stage, higher mental functioning is required, the pupil must make value judgments about data, and consider decisions which might be made on the basis of the report and the evaluation. Stage VI, then, represents the critical phase of the entire data processing experience. It is entitled data evaluation and decision making.

STAGE VII—*social sciences, economics and philosophy* — represents the contribution of the social science curriculum to the pupil for his use in making decisions and value judgments required in Stage VI. It can be readily shown that in a free society, the nature of decisions will differ from that of an unfree society. The crucial point here is that data in themselves are amoral. The morality is brought in from sources outside of the technical experience.

The VIII stage refers to the whole area of finance which must come into play once decisions are reached if an enterprise is to function.

Stages IX, X, XI and XII respectively, describing *management and production, sales and advertising, transportation and logistics, accounting and analysis,* logically flow from plans to utilize the decisions made on the basis of an evaluation of data.

It may be helpful at this point to describe two examples to show the stability of work method in a variety of different and changing fields. Pupils may be given soil samples secured from civil engineers preparing to build a housing project. The pupils can observe the soil samples using chemical and mechanical procedures, record what they observe, organize, interpret and report their findings and make judgments regarding the suitability of that soil for supporting the buildings. Their decisions will be influenced by economic facts such as site preparation costs, methods of financing, and so forth. In the medical field, students may take blood samples from animals; observe, record, organize, interpret, and report their findings; and render judgments based on conditions laid down in the original experiment. For example, the problem might be concerned with diet or routine, etc. Again, decisions will be influenced by considerations arising from stages VII through XII.

This conceptual approach lends itself both to the segregation of pupils for the purpose of instruction and to the integration of pupils for their daily work. Tasks may be formulated which are educationally relevant, requiring specialization of some and integration of all. Thus, pupils may be at work on a problem which has in it elements illustrating the concept of friction. Some pupils will be able to operate with the notion of friction as a mathematical construct. Others will take from the experiment the notion of friction as force. Still others will only be able to conceive of friction as heat. In the educationally relevant task, the possibility of enhancing the dignity of all in the work world may be moved forward and the fruits of specialized instruction also be realized.

A further use of such a conceptualization as described here lies in the area of

guidance. Data and problems arise from a multitude of job families. In the process of learning to handle data, pupils gain experience, not only as practitioners in those job families, but gain an impression of the jobs themselves.

It is easy to visualize that what has been described is but the first plank in a sequential educational program. The second plank might well consist of the establishment of specialized laboratories in each school where pupils can behave as practitioners and render useful service to the school as well as to themselves. For example, schools might develop a physiology laboratory, a human potentials laboratory, a materials selection laboratory, etc. Pupils could take the skills and knowledge which they have gained through an understanding of the twelve stages described in Figure One and apply them to real situations which exist in the school. For example, using a table of random numbers, a small group of students from the physical education program might be brought into the physiology lab, manned by pupils, and given physiological tests which will expose physical fitness. Again, in the human potentials lab, pupils might experiment with optimal ways of improving memory, study skills and the like. In the materials selection lab, products to be purchased by the Board of Trustees might be subject to analysis and decisions rendered to the administration and Board about the desirability of purchase. This kind of program could lead to a third plank in which pupils who have served in the specialized labs could be given an opportunity to gain work experience in actual laboratories that exist in the community.

In summary, what is described above is an applied scientific method. Whereas the world of work is in a constant state of flux, some important aspects of the basic work method have not changed. Were we to provide youth with the knowledges and skills described, we would have made a major contribution to their post-high school success. Young people handling data and problems from the "real world," as well as from carefully contrived experiments representative of jobs and major job families would not only gain familiarity and competence in the applied scientific method, and a familiarity with a whole host of professional, technical and vocational jobs, but would actually experience the behavior of a person in an engineering job, or as a hospital technician, a market analyst, or a mechanic. It can also be seen that properly implemented, this conceptual framework can serve as a vehicle by which mathematics, science, English, and social science may be strengthened. The kind of program described above can be most readily carried out as a two or three hour core program utilizing team teaching. In this way, pupils involved in the program would not be denied opportunities in general education.

PROFESSIONAL, technical and vocational education must be viewed *as a whole* to become a unified movement in the direction of training for our complex world. All our programs at all levels — and there are many levels of job opportunity deriving from scientific and technological developments — show *direct relationship*

to scientific and technological cluster fields.

WHILE the functions and levels of responsibility will differ markedly, all jobs in the future will require a degree of comprehension that transcends the merely manipulative. Comprehension must begin at the administrative level, then permeate the teaching level and finally belong to all the American men and women.

Comprehension on the part of administrators and teachers must include excellent understanding of the nature of technical, professional and vocational occupations, the requirements of the specialized fields and a keen awareness of the shifting nature of the world of work. Our goal must be to supply that manpower that can secure the economic and social goals of this great nation.

SECOND WORKSHOP ON VOCATIONAL EDUCATION
July 6-9, 1965
CALIFORNIA STATE POLYTECHNIC COLLEGE

A conference to consider planning, supervision, and administration of work experience programs. Methods of financing through use of federal, state and local district cooperation will be outlined. Guidance in relation to work experience will be carefully outlined. Speakers will include Lewis Levine, Director of the U. S. Employment Services, Washington, D.C., and Myron Olson of the University of Southern California. Cooperating organizations sponsoring the conference are: California Association of Secondary School Administrators, California Counseling and Guidance Association, California Association of School Administrators, California State Department of Education, and California Work Experience Educators of the California State Polytechnic College, San Luis Obispo.

For further information, write:

Dr. W. P. Schroeder, *Head, Education Department,*
California State Polytechnic College, San Luis Obispo, California